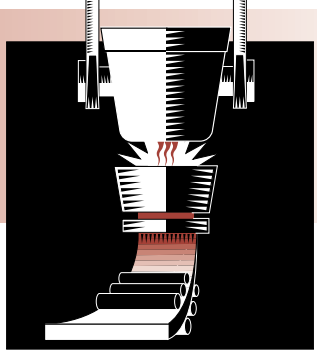
STEEL

Project Fact Sheet



Recycling of Waste Oxides in Steelmaking Furnaces

Benefits

- Eliminate the need to land-fill an estimated three million tons of waste oxides each year which could save up to $120 million annually
- Savings of up to $180 million and 15 trillion British thermal units (Btu) annually by recycling waste oxides

Applications

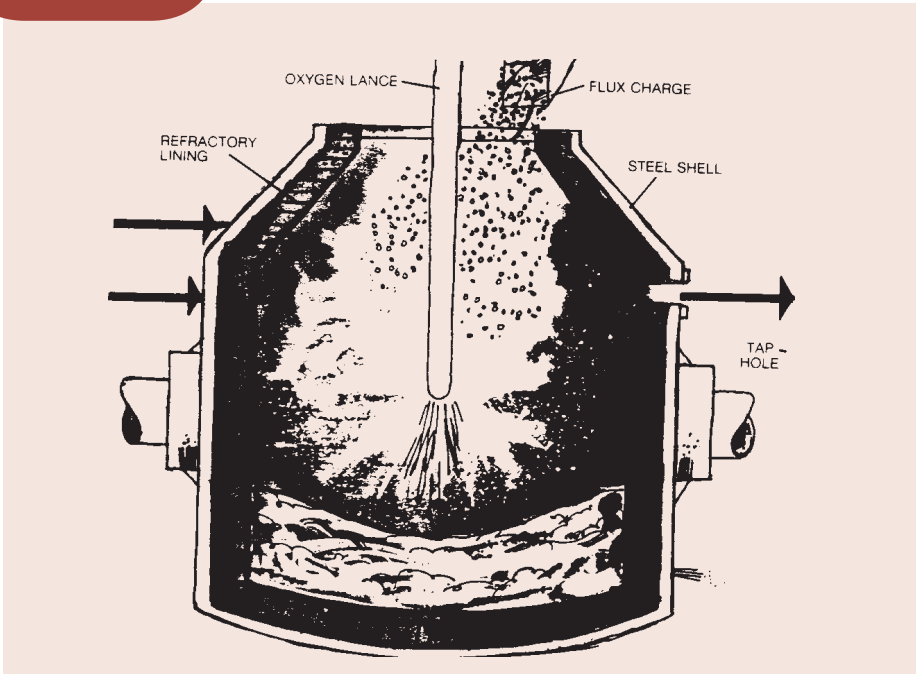
The technology has the potential for application to the 100 million tons per year of liquid steel produced. Successful development and application of the operating practices to utilize these waste oxides, due to the large benefits, could be adopted by all steel producers.

Development of an operating practice which will permit the recycling of waste oxide agglomerates in the steelmaking vessel

The U.S. Department of Energy is collaborating with the U.S. steel industry to develop an effective operating practice for recycling of waste oxide agglomerates in the steelmaking furnace. The successful development of this operating practice and its application to the production of liquid steel would result in improved energy efficiency and reduced steel product costs.

The application of the concept to high tonnage steel production operations requires many challenges to be overcome. Slopping, caused by the violent evolution of gas during steelmaking interferes with the recycling of waste oxide agglomerates directly into the steelmaking process. The project will examine the mechanism of slopping induced by the addition of waste oxide agglomerates into the steelmaking vessel, develop operating practices which will permit the addition of these agglomerates while avoiding slopping, and perform industrial trials based on the results of this research.

Basic Oxygen Furnace



Cross-section of a basic oxygen furnace.

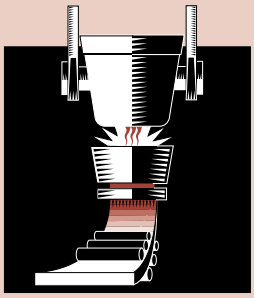
Project Description

Goal: To develop an operating practice that will enhance the recycling of waste oxide agglomerates in the steelmaking vessel, and to determine the mechanism of zinc oxide formation along with identification of factors that control its size distribution. The project also seeks to optimize the separation of zinc oxide during dust collection.

The project will have four major areas of investigation: 1) experimental work on gas generation; 2) slag foaming; 3) plant trials to develop operating practice; and 4) zinc partition studies.

Progress and Milestones

- Project start date, April 1998.
- Recommendations to avoid slopping in steelmaking were completed and presented to the American Iron and Steel Institute (AISI).
- Literature survey on slag foaming and gas generation has been completed and provided to AISI.
- A furnace has been adapted for slag foaming experimental work and experiments have been completed.
- Zinc partition studies have begun.
- Initial results of work on slag foaming have been provided to AISI.
- Project review meeting, May 2000.
- Completion of plant trials to minimize slopping, December 2000.
- Draft project report submitted, December 2000.
- Completion of zinc oxide formation experiments, January 2001.
- Project completion date, January 2001.



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